

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
14 July 2005 (14.07.2005)

PCT

(10) International Publication Number
WO 2005/064783 A2

(51) International Patent Classification⁷: **H03B 9/14, 5/40,**
H01L 41/00, G10K 11/36, G01R 33/02, H03H 9/42, 9/64

(74) Agents: **BIRD, William, E. et al.**; Bird Goën & Co, Klein
Dalenstraat 42A, B-3020 Winksele (BE).

(21) International Application Number:
PCT/EP2004/014816

(81) Designated States (*unless otherwise indicated, for every
kind of national protection available*): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(22) International Filing Date:
24 December 2004 (24.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
03447312.4 24 December 2003 (24.12.2003) EP
60/533,323 29 December 2003 (29.12.2003) US

(84) Designated States (*unless otherwise indicated, for every
kind of regional protection available*): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): IN-
TERUNIVERSITAIR MICROELEKTRONICA
CENTRUM VZW [BE/BE]; Kapeldreef 75, B-3001
Leuven (BE).

Published:

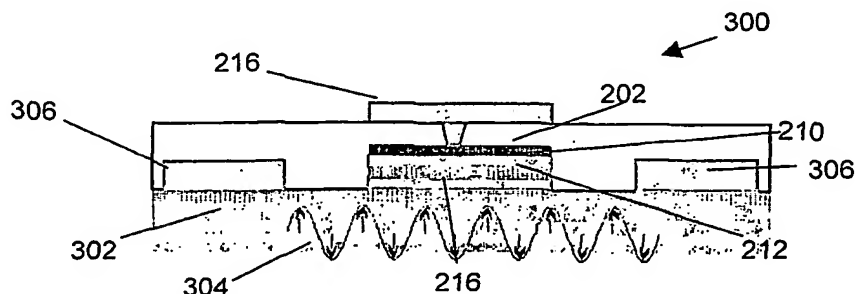
— without international search report and to be republished
upon receipt of that report

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **EYCKMANS,**
Wouter [BE/BE]; Technische- Schoolstraat 87, B-2440
Geel (BE). **LAGAE, Liesbet** [BE/BE]; Oud-Strijdersstraat
109, B-3020 Herent (BE).

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: FULLY INTEGRATED TUNEABLE SPIN TORQUE DEVICE FOR GENERATING AN OSCILLATING SIGNAL AND METHOD FOR TUNING SUCH APPARATUS



(57) Abstract: The present invention is related to a device and corresponding methods for generating an oscillating signal. The device comprises a means for providing a current of spin polarised charge carriers, a magnetic, e.g. ferromagnetic, excitable layer adapted for receiving the generated current of spin polarised charge carriers thus generating an oscillating signal with a frequency ν_{osc} and an integrated means for interacting with said magnetic, e.g. ferromagnetic, excitable layer such that a selection of said oscillation frequency is achieved. No external field needs to be applied to select or tune the frequency. Different types of integrated means can be used, such as e.g. means inducing mechanical stress in the magnetic, e.g. ferromagnetic, excitable layer, means inducing exchange bias interactions and means inducing magnetostatic interactions.

WO 2005/064783 A2